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(56) Documents cited

GB 2173597 A GB 2138545 A GB 2124777 A

GB 2094949 A WO 89/06023 A US 5018208 A

US 4961138 A US 4567749 A

"Dental plate touch pad gives more control for
disabled users", Eureka, August 1990, page 49.

(58) Field of search

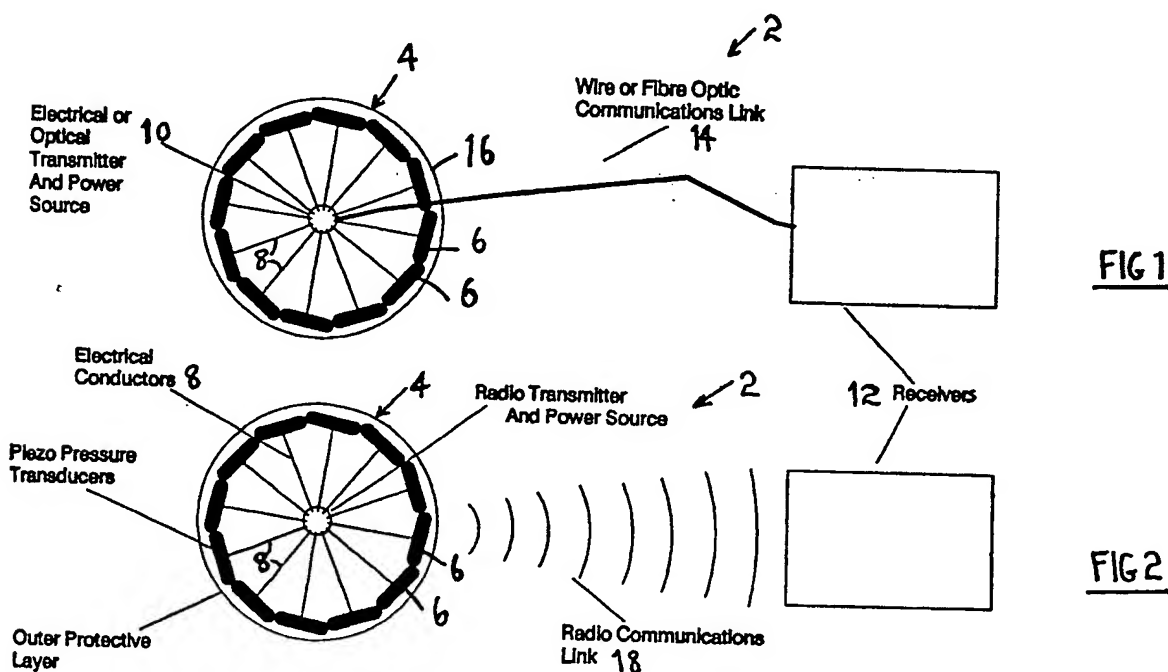
UK CL (Edition K) F2Y YCB YCE YTA YTB

INT CL⁵ G06F 3/02 3/03, G06K 11/06 11/18

Online database: WPI

(54) Pressure-activated computer data input apparatus

(57) The apparatus (2) comprises a force or pressure-responsive transducer (4) and a computer (12) for receiving the signals from the transducer (4) via connector means (14). The transducer (4) may take the form of an array of piezoelectric devices 6 activated by pressure from a part of the person's body, eg the hand or the mouth, eg of a handicapped person. The connector means (14) may be a wire, fibre optic or radio link. Data may be generated according to the sequence, duration or magnitude of pressure pulses.



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FIG 1

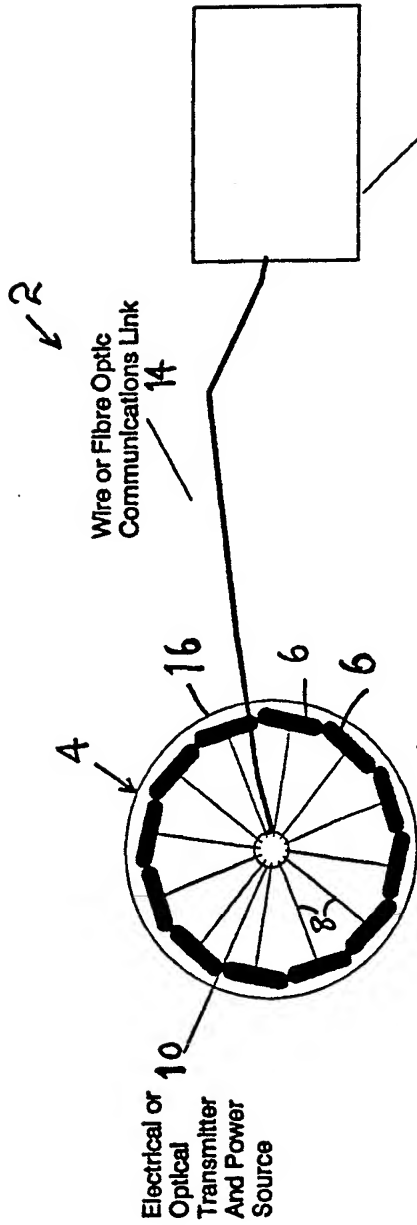
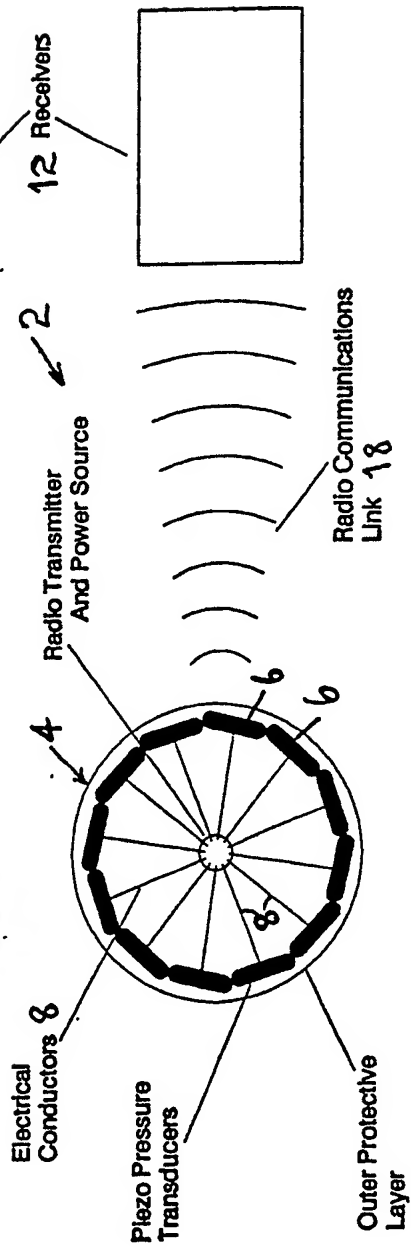


FIG 2



- 1 -

PRESSURE ACTIVATED APPARATUS FOR ENABLING
A PERSON TO ENTER DATA INTO A SYSTEM

This invention relates to pressure activated apparatus for enabling a person to enter data into a system.

Accordingly, in one non-limiting embodiment of the invention there is provided pressure activated apparatus for enabling a person to enter data into a system, which apparatus comprises pressure-responsive transducer means for producing signals consequent upon the application of pressure, computer means for receiving the signals from the transducer means, and connector means for affording a signal-transmittable connection between the transducer means and the computer means.

The pressure activated apparatus of the present invention may advantageously be used such that a person's hands are left free. Persons using the apparatus of the invention may be able to walk and talk in a free manner.

Different users of the apparatus of the invention may cause the computer means to interpret different pressure sequences in different ways. An airline pilot might use a morse code sequence of pressure pulses. A victim of cerebral palsey might use different tongue rolling actions on the transducer means to convey required information. A computer operator might use the apparatus of the invention as an alternative computer pointing device.

Preferably, the transducer means is a piezo-electric transducer means. Other types of transducer means may however be employed. Where the transducer means is a piezo-electric transducer means, then a plurality of piezo-electric transducers may be employed. The piezo-electric transducers may be employed in any configuration appropriate to the mode of use of the apparatus of the invention so that, for example, the piezo-electric transducers may be arranged in a circle, square or rectangle.

The transducer means may be constructed to be mouth-activated so that, in this case, the transducer means will normally be placed in a person's mouth. Data may be generated by a person exerting pressure on the device using the teeth and/or the tongue. An advantage of a mouth-activated device is that even in the most severely handicapped persons, enough brain function is left to control the organs in the mouth for eating, breathing and speech. Thus the apparatus of the present invention may be of extreme use for severely handicapped persons. Another advantage of a mouth-activated device is that the neural connections to the central nervous system, controlling the organs in the mouth cavity, have direct connections to the areas controlling speech and communications output, more so than in any other part of the body. This enables the apparatus of the present invention to be biologically appropriate for all forms of data generation.

An advantage of using piezo-electric transducers is that they can be activated by means of electronic pulses to generate a buzzing effect, so that the apparatus can also act as an output device, offering the user positive feedback.

5 If desired, the transducer means may be activated by pressure from another part of a person's body, for example the person's hand. In this case, the required pressure may be generated by the person using his or her fingers.

10 The general shape and the materials used for the transducer means will be chosen to be appropriate for that part of the person's body which is to produce the pressure. Thus, for example, the apparatus may be made where possible from non-toxic materials.

15 The computer means may be any suitable computer means which is appropriate for the intended use.

 The connector means may be a wire communications link, a fibre optic communications link, or a radio communications link having a radio transmitter and a radio receiver.

20 Embodiments of the invention will now be described solely by way of example and with reference to the accompanying drawings in which:

 Figure 1 shows first pressure activated apparatus for enabling a person to enter data into a system; and

Figure 2 shows second pressure activated apparatus for enabling a person to enter data into a system.

Referring to Figure 1, there is shown pressure activated apparatus 2 for enabling a person to enter data
5 into a system. The apparatus 2 comprises pressure-responsive transducer means 4 for producing signals consequent upon the application of pressure. The transducer means 4 comprises a plurality of piezo-electric transducers 6 arranged in a circle and connected by electrical conductors 8 to a transmitter
10 and power source 10. The transmitter and power source 10 may comprise an electrical or an optical transmitter.

The apparatus 2 further comprises computer means 12 for receiving signals from the transducer means 4. The apparatus 2 still further comprises connector means for
15 affording a signal-transmittable connection between the transducer means 4 and the computer means 12. As shown in Figure 1, the connector means is a wire or a fibre optic communications linking line 14. The wire or fibre optic communications linking line 14 is employed as appropriate in
20 dependence upon whether the transmitter in the transmitter and power source 10 is an electrical transmitter or is an optical transmitter.

The piezo-electric transducers 6, the electrical conductors 8, and the transmitter and power source 10 may
25 be housed in a protective outer covering 16.

Referring to Figure 2, similar parts as in Figure 1 have been given the same reference numerals for ease of comparison and understanding. In Figure 2, the connector means for affording a signal-transmittable connection between the transducer means 4 and the computer means 12 is a radio communications link 18.

The apparatus 2 shown in both Figures 1 and 2 is such that the transducer means 4 forms a mouth-activated device. As a result of exerting pressure by the teeth and/or the tongue on the transducer means 4, the piezo-electric transducers 6 act as sensors to sense the varying pressures and to generate appropriate signals for the computer means 12. The computer means 12 can act on the received signals in any suitable and appropriate desired manner.

The illustrated piezo-electric transducers 6 may be used to inform the user of the current orientation of the transducer means 4 in the user's mouth. The piezo-electric transducers 6 may be positioned in dimples or domes under the outer covering 16. Because the apparatus 2 is to be used in a user's mouth, the outer covering 16 will be made of a non-toxic material. The outer covering 16 will also be flexible so that the piezo-electric transducers 6 can sense pressure variations. Many plastics materials can suitably be used. The translation process from the piezo-electric transducers 6 into data may take into consideration the sequence, duration and magnitude of pressures that are

used to activate the piezo-electric transducers 6.

5 It is to be appreciated that the embodiments
of the invention described above with reference to the
accompanying drawings have been given by way of example
only and that modifications may be effected. Thus, for
example, the piezo-electric transducers 6 can be replaced
by other pressure-responsive transducer means. Also, the
precise shape of the transducer means 4 may be varied, for
example to suit the case where the pressure transducer
10 means 4 is to be held in a user's hand and operated by
finger pressure, or is to be held in another part of the
user's body and operated by body pressure.

CLAIMS

1. Pressure activated apparatus for enabling a person to enter data into a system, which apparatus comprises pressure-responsive transducer means for producing signals consequent upon the application of pressure, computer means for receiving
5 the signals from the transducer means, and connector means for affording a signal transmittable connection between the transducer means and the computer means.
2. Pressure activated apparatus according to claim 1 in which the transducer means is a piezo-electric transducer
10 means.
3. Pressure activated apparatus according to claim 1 or claim 2 in which the transducer means is constructed to be mouth-activated, whereby the transducer means is able to be placed in a person's mouth.
- 15 4. Pressure activated apparatus according to any one of the preceding claims in which the connector means is a wire communications link, a fibre optic communications link, or a radio communications link having a radio transmitter and a radio receiver.

5. Pressure activated apparatus for enabling a person to enter data into a system, substantially as herein described with reference to the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number
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Relevant Technical fields

- (i) UK CI (Edition K) F2Y (YCB, YCE, YTA, YTB)
(ii) Int CL (Edition 5) G06F 3/02, 3/03; G06K 11/06,
11/18

Search Examiner

J L TWIN

Databases (see over)

- (i) UK Patent Office
(ii) ONLINE DATABASE: WPI

Date of Search

9 JULY 1992

Documents considered relevant following a search in respect of claims

1-4

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2173597 A (TAYLOR MILLER)	1,4
X	GB 2138545 A (MULLER) - (see eg page 2, lines 76-98)	1,3,4
X	GB 2124777 A (ILLINOIS TOOL WORKS)	1,4
X	GB 2094949 A (PARKER) - (see eg page 1, line 108-page 2 line 39)	1,3,4
X	WO 89/06023 A (N C R)	1,4
A	DENTAL PLATE TOUCH PAD GIVES MORE CONTROL FOR DISABLED USERS, EUREKA, AUGUST 1990, page 49	1,3,4
X	US 5018208 (GLADSTONE)	1,4
X	US 4961138 (GORNIAK) - (see eg column 9, lines 42-64)	1,2,4
X	US 4567479 (BOYD) - (see eg column 2, lines 36-53)	1,3,4

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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